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TECHNOLOGY, FID, AND AFGHANISTAN

A MODEL FOR AVIATION CAPACITY

by

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Biography

Lt Col Brian L. Reece is assigned to the Air War College, Air University, Maxwell AFB, AL. Brian was the McClary award winner at Squadron Officer School and elected Air Force Class President at Command and General Staff College. Over his career, Lt Col Reece is credited with eight combat saves. He has flown over 400 hours of combat as a special operations helicopter pilot and Mi-17 Evaluator, resulting in the capture of numerous known terrorists. He was the 19th Air Force Rotary-Wing Instructor Pilot of the Year and led the team that won the AF-level Chief of Staff Team Excellence Award. He has three master's degrees, and recently spent a year deployed to Afghanistan as the Operational Squadron Commander at Kandahar Airfield. His next assignment is to USSTRATCOM.



Abstract

In 1961, the United States Air Force started aviation advising in order to achieve National Security goals. Since then, Foreign Internal Defense (FID) has gone through countless modifications. Unfortunately, during Operation Enduring Freedom in Iraq, the U.S. military changed how they implemented FID in response to nation-building strategic requirements. The U.S. tried to leverage technology to elevate foreign nations' aviation significantly above their natural capacity. When applied to Afghanistan, it had devastating consequences that continue to haunt advisors, military leaders, and politicians. This essay explores the reasons behind U.S. struggles to develop the Afghan Air Force. Through case study, it analyzes how FID definitions and goals eroded under political pressure. Following this, Afghanistan is used to show how the U.S. military applies FID in an uneven manner that threatens sustainability. In the final section, a model is presented that predicts national aviation technology capacity, where these nations are weak, and which societal strengths to leverage. Case studies demonstrate how it can be applied to every nation in the world and guide U.S. strategic aviation policy.

“Low levels of literacy, and education in general, can impede the development of a country in the current rapidly changing, technology-driven world.” – Central Intelligence Agency

Introduction

U.S. efforts in foreign aviation development are critical to achieving vital National Security goals. Unfortunately, when applying this policy, the U.S. tries to leverage technology to elevate foreign nations and their values above their natural capacity. It never works - technology bends to culture, not the other way around. In the case of Afghanistan, the U.S. Air Force (USAF) attempted to cultivate advanced aviation capabilities within a low technological capacity nation. This is not possible without consequences. In the 2016 international literacy rates list, Afghanistan ranks 214 of 215 countries with a 28.1% reading and writing capacity – 15 years after the initial U.S. invasion.¹ The USAF cannot supplant U.S. military ethos and industrialized technological superiority into any nation that does have the foundation to support it. Three problems reside at the core of U.S. struggles to develop the Afghan Air Force. First, Foreign Internal Defense (FID) definitions and goals are corrupted. Second, FID is applied in an uneven manner that threatens sustainability. Finally, the U.S. needs a model that predicts what levels of technology a nation can sustain, where they are weak, and which societal strengths to leverage. Fixing these problems will change the game.

Afghanistan is a country ruled by geography and lack of infrastructure. The 2001 U.S. and North Atlantic Treaty Organization (NATO) invasion intended to create a stable and self-sufficient Afghan government capable of administering rule of law and effectual governance. Effective governance is the key to stability and America’s military withdrawal.² Poor infrastructure made access for domestic security forces difficult and the U.S. sought an air solution.³

Political pressure and over-estimation of technological capability resulted in numerous questionable Afghan aircraft purchases. The Afghan C-27 program quickly became defunct. \$800 Million in aircraft purchases led to zero operational aircraft and the airframes were sold for \$37,000 in scrap metal.⁴ 112 Mi-17s purchased at a price of \$1.3 Billion are projected to be replaced in 2018 by HH-60 Blackhawks due to aircraft parts availability and attrition of the fleet.⁵ \$50 Million worth of C-208B caravans are underutilized, four C-130s are beyond Afghan capacity to maintain, and A-29s attack aircraft have yet to be effectively used against the enemy. As of 2017, the Afghans are incapable of long-term aircraft maintenance or logistical support, rely heavily on contractors, and cling to 1980s Russian training mentalities. Aircraft purchases did not match Afghan technological capacity nor long-term NATO strategic goals. New acquisitions continue to disregard the lessons learned from years of aerial advising and nation-building.

The U.S. would never hand someone a race car with the expectation that they would use it properly, maintain it, and find spare parts when needed. Even if they begged for it. The action is irresponsible, even if the intentions are good. Instead the U.S. would train them for years until they grew and learned responsibility on smaller, less complicated vehicles. Many years later, when the individual was ready, it would be time for Indianapolis. But you would never just send the driver to the race. They need an entire team ready to support, maintain, and organize. This analogy may seem outrageous, but in reality, it is apt for aviation. Knowing the capability before handing over dangerous and complicated equipment is prudent, not prejudicial.

The preferred Air Force approach to nation-building is to provide technologically advanced aircraft and developmental training. USAF FID training structure focuses on kinetic operations, assumes state aptitude, and overlooks the foundational problems of sustained aviation

in undeveloped nations. If the Air Force wishes to be successful in cultivating aviation capabilities within low-technological-capacity nations, then serious strategic changes need to be made. U.S. policy makers confuse foundational capability-building activities with FID; they should apply systems thinking to what drives sustained aviation success and understand the national criterion for technical capacity. The Air Force focuses on air operations (kinetic) and does not appropriately weigh the nation's maintenance and logistical capacity when forming decisions about aircraft purchases or military financing. A model must be developed in order to deliver the *best military advice* to political and bureaucratic agencies for Afghanistan and future aviation development endeavors.

Matching aircraft purchases to the technological capacity of host nations can help avoid future costly mistakes. In this essay, two historical case studies will show the evolution of FID. The third case will apply a comparison of operations, maintenance and logistics as they are executed in the Afghanistan Air Force. The final section develops an in-depth model to calculate country aviation capacity. To demonstrate the effectiveness, three disparate size countries are utilized as examples. This essay is not to present counterfactuals. It will offer evidence crucial to future military aircraft deals with undeveloped and emerging nations.

FOREIGN INTERNAL DEFENSE vs. INTERNAL DEFENSE AND DEVELOPMENT

Words have important meanings and acronyms often rob their users of the original intent. Foreign Internal Defense is often used as a catch-all term to encapsulate all military activity that bolsters a foreign nation's existing capacity. FID was once a narrowly scoped endeavor. Expansion of this term is a problem, best reflected in the new Internal Defense and Development (IDAD) activity being used underneath the FID umbrella. These activities are strategically

different. Core assumptions of FID are detrimental if used in IDAD. Yet, Joint Publication 3-22 treats them as the same. USAF leaders need to know how this confusion developed.

THE ORIGINAL AVIATION FID - VIETNAM

President John F. Kennedy officially implemented the first enduring Foreign Internal Defense mission in 1961. However, the USAF had already been conducting FID training for six years with OPERATION JUNGLE JIM.⁶ The French Air Force trained the South Vietnamese Air Force from 1951 to 1955, when French forces withdrew.⁷ From 1955 to 1962, the U.S. Air Force supplied 55 T-6 “Texan” training aircraft to Vietnam and trained pilots at Hurlburt Field, FL.⁸ Tactical Air Command led the 1962 FID mission as American crews traveled to Vietnam.⁹ USAF squadrons trained Vietnamese until the 1972 U.S. withdraw, leaving the South Vietnam Air Force with 15,000 personnel and 460 aircraft.¹⁰

Lessons abound in this case. First, the South Vietnam Air Force still needed U.S. logistical and maintenance support in 1972, 21 years after the French started training in 1951. Secondly, the first 12 years of operations consisted almost solely of training aircraft and building competency in simple French and U.S. aircraft. The U.S. supplied aircraft that were domestically-built, ensuring internal logistics. Illiteracy and governance plagued the South Vietnamese, extending U.S. advising efforts. As South Vietnamese capability developed, the aircraft complexity also increased. Although this would normally be considered a success, the U.S. still lost the war.

POST VIETNAM

Failure of the Air Force to impact the ultimate Vietnam War outcome was influential on FID development. In a program that lasted for 21 years between the French and U.S. advisors, the South Vietnamese Air Force became more competent as national technological capacity also

matured. Yet, the USAF recognized failures in the approaches and requirements to bring a nation from nothing to fully autonomous. Leaders acknowledged that specialized training and skills were required to effectively conduct FID.

The mission found a new home in Air Force Special Operations Command (AFSOC), who used selective criterion to administer the program. They analyzed country capabilities, trained personnel on cultural background and language, and then utilized extreme care in which nations received aide. Utilized as a counterinsurgency, counter-drug, and counterterrorism tool, the FID program was incredibly successful until 2003. Iraq looked like Vietnam to AFSOC.

FID IN IRAQ

It was a hard, long road for Iraqi aviators. In the 1980's, Iraq had one of the largest, most capable Air Forces in the world. The Iraq-Iran War, the First Gulf War, Operations SOUTHERN and NORTHERN WATCH, the Second Gulf War, and de-Baathification left Iraq militarily broken and with a non-existent Air Force. In the span of 12 years, the Iraq Air Force (IqAF) went from 900 modern aircraft to virtually zero.¹¹ Unlike Afghanistan, an insurgency set in immediately and military planners turned to the Air Force to develop a FID program to re-establish the IqAF.

AFSOC quickly determined the requirements were outside traditional FID architecture and beyond their manning capabilities. AFSOC could not conduct a mission of this size and scope. In response, Central Command stood up a new organization called the Coalition Air Force Training Team (CAFTT) and filled its ranks with aviators who lacked the special operations and language experience. This is the moment FID changed.

Luckily, many factors worked in the favor of the CAFTT. The Iraqis had a deep pool of personnel with aviation experience. Iraq had a male 86 percent literacy rate, a central

government, and oil exports approaching \$500 Billion per year.¹² Former IqAF pilots had received U.S. training on MiG aircraft during the Iraq-Iran War. More importantly, due to legislative cost pressures, the U.S. Government offered the Iraqis cheap and easily maintained aircraft such as Bell UH-1s, Bell 407s, Bell 206s, AT-6s, T-50s and C-208s.¹³

The latent aviation capability, modern economy, and low-end options offered to Iraq combined to create a quick and relatively successful FID operation. Iraq swiftly reestablished a functioning Air Staff and the IqAF remained an independent military service branch. Because of these successes, the USAF and U.S. Government drew the wrong conclusions. They took Iraq latent potential as the norm and anchored expectations to that paradigm. FID and IDAD were now synonymous and the model was exported.

THE FUSION OF FID & IDAD

AFSOC realized decades ago that every aviation FID project was highly specific. In Iraq and Afghanistan, there was pressure to develop without using nation-building terminology. In 2010, JP 3-22 published under the title, “Foreign Internal Defense.” In this document, the term Internal Defense and Development (IDAD) becomes fused with FID. “The focus of U.S. FID efforts is to support the HN’s internal defense and development (IDAD). IDAD is the full range of measures taken by a nation to promote its growth and protect itself from subversion, lawlessness, insurgency, terrorism, and other threats to their security.”¹⁴

FID is IDAD, and IDAD is nation-building. The 201 page JP 3-22 lays out numerous references on ways to build national capability from virtual non-existence. The document refocuses FID from traditional limited roles to all-encompassing national stability and governance. With higher political visibility, acquisition is the new primary FID tool. Based on the 1976 Arms Export Control Act, the U.S. has three avenues to give aircraft to foreign nations:

foreign military sales, foreign military financing, and excess military articles (giving old U.S. equipment away).¹⁵ This choice is fundamental to nation-building success.

Military and State Department officials must ask: what is best for the host nation, not what they want. Immediacy and short-term context drive solutions that are not congruent with long-term U.S. interests. In order to align these needs, decision makers should look at the complete triangle of aviation (operations, maintenance and logistics) and compare that with a commonly accepted framework of societal technological competence. Afghanistan is the model to study for how this can go awry.

Starting a nation from nothing is very different than helping an under-developed nation improve. Afghan Air Force development under the new FID framework is not working at the pace expected based on the previous Iraq experience. Projects are failing, numerous aircraft are now scrapped, and training programs are collapsing as U.S. and NATO support draws down. Shindand Airbase, Afghanistan was the national beacon of all language and aviation training. Within a month of U.S. withdraw, it buckled militarily, closed the flight school and suspended almost all flying due to maintenance and logistic failures.¹⁶ Why is Afghanistan so different? FID/IDAD is being applied to inherently different customers. Abysmal literacy and governance differences from Iraq were indicators, making Afghanistan a from-scratch effort. Expectations for zero-capacity countries require patience and a balance rarely sustained.

“The only thing harder than getting a new idea into the military mind is to get an old one out.”
– B. H. Liddell Hart

OPERATIONS, MAINTENANCE & LOGISTICS

Aviation is built on the triad of operations, maintenance and logistics. Operations is the application phase. The aircraft is the most visible and has the greatest physical impact on war

and stability operations. Maintenance is the backbone and a constant source of friction to operations. Utilization rates, aircraft availability, and flight hour tracking for inspections exist to ensure the operability of the aircraft and safety of the crews. More flying always impacts maintenance. A tense balance is required no matter the nation. Behind operations and maintenance is the often forgotten component that keeps everything functioning: logistics. It includes aircraft parts, food, water, oil, bullets, medical supplies, fuel, transportation, and power. Army planners from Napoleon to Petraeus realized this issue is the backbone of any fight, and common thought would place it as the priority. It rarely is.

OPERATIONS

The USAF understands operational capability, as do politicians. In 2007, the U.S. coalition stood up the Combined Air Power Transition Force - Afghanistan (CAPTF-A).¹⁷ Aircraft acquisition was executed under the Foreign Military Assistance portion of the DoD in conjunction with the State Department. Upon the request of the Afghan government, Kazan Industry Mi-17 helicopters were purchased for the military in a continuation of the Presidential Airlift program established in 2005.¹⁸ The Department of Defense bought more than \$1 Billion in Mi-17s from Rosobaron Exports, along with a logistical trail to the Russian government-owned company.¹⁹ The reason for buying Russian equipment was that pilots still existed with training from the 1979-1987 Soviet Era Afghan occupation.²⁰ Furthermore, it would be easier to transition U.S. pilots to Russian systems than to train the Afghans to Western Aviation standards.²¹

Aircraft flooded into Afghanistan. The U.S. focused immediately on training crews and an Air Force capable of execution. Several books and articles are devoted to the process. To summarize: cultural barriers and training ethos were harder to translate than expected; younger

pilots fared better and learned at a quicker pace, but were displaced by legacy aviators with political connections and little drive. Capability slowly improved, but with several operational losses.²² During 2015, Kandahar lost four aircraft and Kabul lost five.²³ However, the Afghan Air Force was directly engaging enemy targets from the air and impacting the ground war.²⁴

FID/IDAD operations developed over a period of ten years. The efforts were led by CAPTF-A, renamed to National Air Training Command – Afghanistan, and then Train, Advise, Assist Command – Air (TAAC-Air). The aircraft were advanced, but not unacceptably so. The loss of 25 Afghan aircrew during 2015 was difficult, as it killed two squadron commanders and four evaluators. NATO puts a preponderance of effort toward training aircrew. This is the common focus of FID: operations. It achieves results and leaves the country with operators capable of kinetic actions required for security. Operations success is the problem. As a consequence of kinetic focus, maintenance gets left behind.

MAINTENANCE

The problems for maintenance training in zero capacity nations all point back to a basic issue. The FID model focuses on operations and assumes levels of competence at outset. Iraq had educated, trained human capital. Afghanistan lacks that basis and has considerable cultural inhibitors. Low literacy prevents classroom instruction and checklist procedures. Less prestigious than flying, lower quality candidates are shifted to maintenance. Maintenance growth is dependent on recurring training and learning, which is difficult in cultures that place less value on cyclical education. Additionally, politics between operators and maintenance is challenging.

Power politics in Afghanistan are problematic. Village, tribe and nomadic paradigms permeate the military to create a dynamic different from western methodologies. This is an

important factor affecting Afghan Air Force maintenance. Power comes from being able to provide a good or service to a superior or political entity.²⁵ For Afghans, aircraft availability is a reflection on the leadership of the Maintenance Squadron and Group Commanders. Lack of aircraft, despite the reason, is a source of shame (the worst possible offense in Afghanistan). Therefore, activities that impact aircraft availability are resisted passively and actively.

Training is a perfect example. Flight training offers no tangible benefit to Maintenance Leadership and can result in a broken aircraft. Culture models place blame for broken aircraft on maintenance rather than operations, even if to support flight training. As a result, maintenance does not regularly provide aircraft for flight training, even though it is crucial to development. Over half of aircraft crashes in 2015 were due to lack of training, and lack of training was a contributing factor in all other crashes.²⁶ Without training, this will continue.

Only a fraction of the Afghan maintenance corps is functionally literate.²⁷ Even if they could read, technical manuals are in English. Attempts to translate the aircraft manuals to Dari or Pashtun have failed and the contract requirement goes unfilled. Contractor advisors are usually Ukrainian or Czech Republic citizens who use Russian manuals. How do you teach illiterate maintainers about advanced aircraft from a manual written in a foreign language?

C-208s have an advanced multi-mission display and integrated GPS that costs over \$1 million just for the computer.²⁸ A-29s are designed to drop precision guided munitions through advanced targeting computers integrated into the flight controls. Blackhawks are a maintenance intensive aircraft that costs the U.S. military \$6,000 an hour.²⁹ C-130s, PC-12s, and MD-530s will take years to learn to maintain properly.

The pay structure for Afghan maintainers drives lower capability. Maintainers are trained and given a certification from three to one, with one being the highest. Unfortunately,

cultural mentality intercedes. Once trained, Afghans do not accomplish recurring training. Also, they receive additional pay for each certification. Instead of staying in one position to learn, they change jobs for more money. Advisors cannot affect pay or stop benefits, therefore they are powerless to affect this trend. They are also ineffectual at impacting leave or manpower levels.

At Kandahar, there are 204 Afghan maintainers on the manning document. All positions are filled. Yet, only 30 to 50 people report for duty. Leave is driven by a society that respects family more than national duty. Officer vacation is 20 days every two to three months, plus travel time of ten days in each direction, leaving key officer positions unoccupied for more than a month at a time, several times a year. The remaining maintenance personnel are shifted to other positions such as guard duty, personal security, or cooking. The result is 20% of the dedicated force being at work on a daily basis.

Likewise, in TAAC-Air, only two of the nine advisor squadrons are devoted to maintenance. Each was minimum manned and often stop-gapped with missing critical skills. In 2015, there were only 40 maintenance advisors, compared to the 100+ operations advisors. The gap is filled with foreign contractors.

Maintenance is a huge problem. Unfortunately, it is not the biggest Afghan aviation challenge.

LOGISTICS

Nomadic societies have problems with distributed goods. Afghan power structures rely on personal or political connection.³⁰ Distributing equipment based on request rather than gaining political favor is a foreign concept to the tribal Afghan culture. Equally debilitating is the custom of skimming from the delivery. Logistic advisors warn, “Host nation trucks often arrived with less than 90 percent of the uploaded quantity, arrived late, or did not arrive at all.”³¹

Modern aviation logistics is complicated by nature. Aircraft parts availability, communication between supply depots and outposts, and distribution are difficulties that plague technologically sophisticated countries. In Afghanistan, logistics remains the greatest detriment to sustained aviation operations.

The Afghan central supply depot was established in Kabul on a hub and spoke model, holding just over \$4 Billion in assets.³² The dispersed battlefield and poor infrastructure forced advisers to create an electronic tracking system designed for international logistics. The Afghans then distributed the goods through official chains of command to the outposts. Everything was tracked by computer, allowing the central network to know the status and location of goods.³³

Afghan computer competency is incredibly low. At Kandahar, the buildings were constructed with Ethernet ports, but the contract did not include running actual internet to the buildings. Only three of the 30 Air Wing buildings had internet access in 2015.³⁴ Even if units were trained, they could not access internet programs. The central hub reverted back to paper tracking of \$4 billion in assets.³⁵ To add to the condition, units typically only had enough fuel to run power between three to ten hours a days during the summer.³⁶

The Afghan Air Force is subordinate to the Afghan Army. All logistics, to include water, fuel, and oil, must be approved by the local Afghan Army Corps Commander.³⁷ Goods and equipment, if approved and released by the central hub, then flow back through the Afghan Army Corps before it comes to the requesting unit. The Army Corps makes decisions about how much the unit actually needs and how much it will keep for its own use.³⁸

An aviation enterprise cannot function in this manner. Power is required for lights, diagnostic tools, and installation equipment. Water is vital to operating in a desert environment. Aircraft parts tracked by hand are lost. Compounding the issue, Russian government-owned Mi-

17 companies confiscate any helicopter found with a part not produced by a Russian-approved source. If the Afghans do not order in advance, their aircraft are grounded.

Of the 200+ personnel in TAAC-Air, there are only a handful of staff personnel advising on logistics. Joint Pub 3-22 is adamant that, “Logistics is essential to friendly and threat operations.”³⁹ However, unlike maintenance and operations, it is given no direct attention as to how to create or maintain a host nation logistics network. Afghan FID/IDAD operations all but ignore the importance of logistical supply. The difficulty of disassociating cultural norms and training advanced technical skills to barely literate logisticians is an immense challenge.

THE TRIAD

FID is about a triad of capabilities – operations, maintenance, and logistics. Ironically, the one with the most focus (operations) is the easiest to execute. Aviators are taught through rote memorization and hands-on repetition, especially in older aircraft with analog systems. However, modern technical experience becomes critical as the complexity of the aircraft increases. The problem compounds in support functions such as maintenance and logistics. An evenly balanced FID/IDAD structure can help develop a nation’s aviation, but the problems quickly escalate if the aviation assets do not match the technological capacity of the society.

The problem thus far for decision-makers is the lack of a developed tool to indicate the proper level of aviation capability they should provide. Military planners often use PMESII (Political, Military, Economic, Social, Information, Infrastructure) to assess the operational environment. However, there is no direction on where to find this data, how to ensure objectivity, or scoring methodology. Aviation is also a specific arena, requiring a tailored tool. The following introduces the “Reece Aviation Capability and Aptitude Model (RACAM).”

MODEL FOR TECHNOLOGICAL CAPACITY

Reece Aviation Capability and Aptitude Model (RACAM)

RACAM is designed to guide aviation acquisition choices for all nations, not just Afghanistan. A nation's technological capacity is formed through human capital, governmental strength, and societal institutions.⁴⁰ RACAM measures this through six distinct categories: Literacy, Economic Prosperity, Governance, Migration, Logistical Performance, and Historical Aviation Capability. Countries graded objectively in each category are scaled together to formulate a technological capacity ranking. The 0-60 score is compared to four distinct capability groups built for this model: undeveloped, emerging, developing, and developed nations. This gives leaders pre-established levels of aircraft to match against any nations' FID/IDAD needs.

Detailed discussion on each categories is necessary to understand what it means and why it is connected to technological capacity. An objective method of measuring is included in each section. Mexico, Norway and Afghanistan are included as example nation case studies.

LITERACY

Literacy is not a measurement in of itself, but rather a reflection of societal access and dedication to education. The United Nations focused on this issue in the 1948 Universal Declaration of Human Rights to acknowledge not just the need for literacy, but that it is a basic human right.⁴¹ The United Nations Educational, Scientific and Cultural Organization (UNESCO) states that, "Literacy skills are fundamental to informed decision-making, personal empowerment, active and passive participation in local and global social community."⁴²

Literacy is a key component of human capital. It drives what percentage of the population can perform technical tasks, follow checklists, and achieve higher education. Even

minor illiteracy has devastating effects on the intellectual capability. Although literacy is usually broken down into prose, document, and quantitative, these levels are not reported to international institutions.⁴³ UNESCO publically provides overall literacy data on individuals over 15 years of age.⁴⁴ Based on recommendations by UNESCO and the World Literacy Foundation, Figure 1 scores this category:⁴⁵

LITERACY RATE (UNESCO)	SCORE
99-100%	10
98-98.9%	9
97-97.9%	8
96-96.9%	7
95-95.9%	6
93-94.9%	5
90-92.9%	4
85-89.9%	3
75-84.9%	2
60-74.9%	1
0-59.9%	0

Figure 1

ECONOMIC PROSPERITY

Economic prosperity is the key to affording the expensive logistics and maintenance that aircraft require. Nations' disposable income is directly tied to the sophistication of the aircraft they can afford. Economic prosperity can be measured through: Gross Domestic Product (GDP) Purchasing Power Parity (PPP) and national unemployment rate. These two areas reveal the current economic strength of a nation. They do not consider potential wealth, as that particular revenue is not part of the current economic model.

There are several different measures of GDP: PPP, official exchange rates (OER), real growth rate, composition by end use, per capita, and composition by sector of origin.⁴⁶ While some agencies use OER, it is not the best method for aviation enterprises. PPP offers a better view as it “compares the gross domestic product or value of all final goods and services produced within a nation in a given year.” Higher outputs equate to affording expensive

technology. The PPP is on a zero to seven point scale, derived from numbers published by the UN International Comparison Program (UNICP).⁴⁷

Economic instability can be predicted through unemployment rates. Unemployed persons do not contribute to the overall economy and exhaust government resources. As unemployment increases, it indicates restricting job markets and a shrinking economy.⁴⁸ Youth are the most likely to be unemployed, a precursor to civil unrest or terrorist activities as they become disenfranchised. Numbers are reported by the International Labour Office database LABORSTA, UN Statistics Division, and International Monetary Fund offices.⁴⁹ This category is a zero to three scale. The U.S. Department of Labor considers 4-6 percent unemployment ideal. Less than 4 percent is inflationary, and more than 12 percent is harmful.⁵⁰

The chart and scoring for economic prosperity (GDP PPP + Unemployment):

GDP PPP	SCORE
\$10+ TRILLION	7
1-10 TRILLION	6
500-999 BILLION	5
200-499 BILLION	4
1-200 BILLION	3
500-999 MILLION	2
100-499 MILLION	1
0-100 MILLION	0

Figure 2

UNEMPLOYMENT	SCORE
4-6 %	3
0-3.9%,6.1-9%	2
9.1-12%	1
12.1+%	0

Figure 3

GOVERNANCE

Government is the system adopted for administration and public policy. There are 31 official government types and attempts to place levels of strength based on government type are highly biased. Instead, government type is considered irrelevant to strength of governance. This category focuses on government stability and effectiveness.

The prevalence of crime is directly impactful on the government's ability to maintain Rule of Law. However, calculating crime is an incredibly difficult and subjective task. A

majority of crime goes unreported, especially in countries with high crime.⁵¹ Furthermore, criminal codes are not identical across nations, creating comparison disparity.

Measuring crime is not enough. For Rule of Law, a variety of other factors are critical, such as number of police, quality of judges, conviction rates, and time to trial. The Economist Intelligence Unit (EIU) has a complex algorithm for business risk that is intended to be applied for companies looking to invest within any country. This index works perfectly for FID/IDAD aviation. The algorithm takes raw data from the UN Office on Drugs and Crime through the UN Surveys on Crime Trends and the Operations of Criminal Justice Systems.⁵² This data, along with Interpol records, allows EIU to grade nations' business risk in four categories: Security Risk, Political Stability, Legal and Regulatory, and Government Effectiveness.⁵³

Each country is given a score on the risk matrix of A through E, with E being the highest risk. Each category is scored on a 0.5 point basis; an A earns 2.5 points and E earns 0. The line between C+ and C- will also carry a 0.5 point division as this is the point where risk starts to greatly increase.⁵⁴ There is one factor not included in the risk matrix that must be addressed.

Corruption is the number one detractor from capable and sustainable operations. A very strong and robust government is quickly undercut by corruption in its institutions. In the aviation industry, it impacts operations through fraud, waste and abuse. Aircraft may be used to aid criminal enterprises operating in the region. Maintenance is heavily worker dependent and resource constrained. Corruption invariably leads to less workers and missing equipment. Logistics is most effected by corruption, as bribes for necessary equipment and "lost or light" shipments are common.

Transparency International created the Corruption Perceptions Index (CPI) in 1995 to watch and grade every nation on their perceived and real levels of corruption.⁵⁵ The 2016 CPI

draws from thirteen surveys and calculations from 12 international institutions.⁵⁶ A high score correlates to less corruption. Since corruption is a negative factor to aviation and impacts the strength of governance, it must act as a detractor in the formula. Corruption is a 0-10 scale.

Governance is scored: (Security Risk + Political Stability + Legal and Regulatory + Government Effectiveness) – (Corruption). Using this calculation, a negative score is possible. That negative score is carried forward.

POLITICAL STABILITY	SCORE
A	2.5
B	2.0
C+	1.5
C-	1.0
D	0.5
E	0

Figure 4

SECURITY RISK	SCORE
A	2.5
B	2.0
C+	1.5
C-	1.0
D	0.5
E	0

Figure 5

LEGAL & REGULATORY	SCORE
A	2.5
B	2.0
C+	1.5
C-	1.0
D	0.5
E	0

Figure 6

GOV'T EFFECTIVE	SCORE
A	2.5
B	2.0
C+	1.5
C-	1.0
D	0.5
E	0

Figure 7

CPI	SCORE
85-100	0
75-85	1
70-75	2
65-70	3
60-65	4
50-60	5
45-50	6
40-45	7
35-40	8
30-35	9
0-30	10

Figure 8

MIGRATION

Migration is another economic factor reflective of overall national conditions. Positive growth shows nations attract human capital, whereas negative growth demonstrates loss of potential. If industry is growing, economic and social opportunities will have an attractiveness factor. Negative intangibles and disenfranchisement have an expelling effect. Retaining and attracting talent is vital to aviation growth.

Immigration is the number of persons entering the country, typically represented by number of migrants entering per thousand people in the country. Countries with large populations may have smaller immigration percentages due to existing large population, yet should still have a positive number. Per the UN, “the net migration rate does not distinguish between economic migrants, refugees, and other types of migrants, nor does it distinguish between lawful migrants and undocumented migrants.”⁵⁷

Emigration is the number of people exiting any nation. In war-torn and ungoverned nations, it may reflect large numbers of refugees. Emigration is destructive to the human capital because the personnel exiting are typically skilled or educated. The International Organization for Migration (IOM) calls this brain drain, “emigration of trained and talented individuals from the country of origin to another country resulting in a depletion of skills resources in the former.”⁵⁸ Mid and advanced aviation levels require a talent pool. If the net migration is negative, the best candidates to support the aviation industry are leaving.

Utilizing the IOM, UN Statistics Division and CIA worldwide tracking of migration, there are charts showing national demographic changes.⁵⁹ Debates rage over what is too much immigration before it triggers racist and xenophobic reactions by the political structure and populace. Since this possible impact is covered through the previous section of governance, all positive immigration is considered good for the sake of this category. Figure 9 shows migration scoring:

NET MIGRATION	SCORE
3%+	10
1-3%	7.5
0-1%	5
-2 TO -0.1%	2.5
GREATER THAN -2%	0

Figure 9

LOGISTICAL PERFORMANCE

Ability to move goods and implement a supply chain is essential to the execution of an aviation enterprise. Global businesses and international suppliers consider these conditions when formulating long-term support contracts for FID operations. Furthermore, a country must be able to distribute goods within its own borders. Roads, airports, waterways and freedom of movement form the support infrastructure. It is not uncommon for FID/IDAD candidates to have a low score, as these exact issues would predicate U.S. aviation support. It should inform planners that logistics will become a higher priority and may require a larger effort than operations or maintenance.

The World Bank tracks this data and supplies it in an annual report.⁶⁰ The Logistical Performance Index (LPI) takes “feedback from operators, supplemented with quantitative data on the performance of key components of the logistics chain in the country of work.” Countries are scored on customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness.⁶¹ Scores reported in the 2016 LPI represent the basis of Figure 10. High scores correlate to better logistical capability.

LPI RATING	SCORE
3.8-4.5	10
3.25-3.8	8
3.0-3.25	6
2.75-3.0	4
2.25-2.75	2
0-2.25	0

Figure 10

HISTORICAL AVIATION CAPABILITY

There is no substitute for experience, especially in aviation. One factor that aided in Iraq’s quick assimilation to IDAD efforts was the previous capabilities of their Air Force and the

presence of a civilian aviation industry. This would have changed if Iraq had remained without a robust aviation program for a period of five or more years. The recency of the aviation program was an important component. Skills and trained personnel atrophy, disappearing as time passes. Too much time before FID efforts and it is essentially starting over with IDAD.

Transference of skills is absolutely critical to preserving a healthy aviation operations and maintenance force. Skills learned during military service should have the ability to translate to a civilian market, and vice-versa. As a nation matures, it must develop aspects of its own aviation industry. This does not imply that manufacturing or aircraft design are required, but that the nation has a stable and growing market for aviation.

In cases of IDAD, it is expected that a nation will have little aviation experience or background. However, this lack of industry may require a more robust and longer scope approach by the U.S. and allies. The peripheral needs are found in aviation support requirements like Air Traffic Control, following International Civil Aviation Organization (ICAO) rules, developing instrumentation for guided Instrument Flight Rule approaches, flight plan tracking, civil aviation requirements, preventative safety and investigation, publishing Notices to Airmen, and meteorological reporting. The extent to which these are preexisting has a huge effect, but lack of supporting institutions could preclude certain types of aircraft from operating until such investment is made.

In Figure 11, aviation capability is a zero to five scale based on the highest level of aviation achieved within the nation. Recency (Figure 12) is a negative influencer, and will subtract zero to five points from the Level Rating score based on the amount of elapsed time. It should not translate to a negative overall score or cause the Level Score to drop below its current level. Civilian airline industry (Figure 13) is a zero to five scale based on robustness of the

aviation industry. Civilian industry is calculated based on number of paved runways, registered air carriers, passenger traffic and freight traffic. Of all categories, this is the most subjective.

The formula is: (Level Rating – Recency) + Civilian Aviation.

LEVEL RATING	SCORE
GEN 4+	5
POST 1990	4
1975-1990	3
1960-1975	2
1945-1960	1
NO INTERNAL	0

Figure 11

RECENCY	SCORE
CURRENT	0
1-5 YRS	1
5-10 YRS	2
10-15 YRS	3
15-20 YRS	4
>20 YRS	5

Figure 12

CIVILIAN INDUSTRY	SCORE
ROBUST	5
ADVANCED	4
DEVELOPED	3
IMPROVED	2
EARLY	1
UNDEVELOPED	0

Figure 13

CAPABILITY GROUPS

All scoring to this point was defined by the six categories. Utilizing objective standards of international organizations, nations can be scored upon their ability to accept, assimilate, and sustain aviation in their national military architecture. Each nation's 0-60 score will place it into one of the four previously mentioned capability groups (Undeveloped, Emerging, Developing, and Developed). Nations in the lowest category will require years of support. Vietnam needed 21 years of support. Iraq needed less time, as did numerous FID operations from 1972 to 2003.

State Department and DoD officials can argue merits of providing outside recommended levels, but should be warned that the foundation for success is not present. Nations will require longer commitments filled with setbacks and frustration. Security agreements, diaspora influences, and politics could sway the group placement of a nation. This does not change the nation's fundamentals or the reality of FID aviation absorption. Secondly, when the U.S. sources aviation from foreign nations, their supply chains and politics will impact the operation.

SCORE	GROUP	NOTIONAL AVIATION ASSETS
0-10	UNDEVELOPED	Cessna aircraft, Bell helicopters, PC-12, T-6, MD-530
11-30	EMERGING	C-130, PC-12, Raven UAV/equivalent, Bell Helos, A-29, T-6, MD-530/Littlebird, C-27
31-49	DEVELOPING	HH-60, C-141, KC-10, F-16 Basic-Block 30, H-47, UAV, A-29, C-130J
50-60	DEVELOPED	Generation 4/5 fighters, All levels helicopter, C-17, KC-46, Advanced armed UAVs, CV-22

Figure 14

CASE STUDIES

MEXICO

The U.S. neighbor to the south is both industrialized and advanced. It is also plagued by crime and drug trafficking, corruption, as well as problems with economic disparity. Figure 15 shows how Mexico scores in the model:

Category	Mexico	Score
Literacy	95.1%	6
Economic	GDP (PPP) – 2.3T Unemployment – 4.4%	9
Governance	Stability – C+ Security – D Legal – B Govt – D Corruption Index – 30 (1.5+.5+2+.5)-(9)	-4.5
Immigration	Emigration -1.7	2.5
Logistics	LPI – 3.11	6
Aviation	Level (75-90) Recency (0) Civil Industry (Advanced)	7
TOTAL	EMERGING	26

Figure 15

ANALYSIS: Score: 25. This puts Mexico in the upper tier of the Emerging Group. This is commensurate with the level of aircraft operated by the Mexican Air Force. Most of their aircraft are Bell helicopters, Beech aircraft, Pilatus PC-7, C-130, Eurocopters, Cessna airplanes, F-5, T-6, HH-60, C-27 and C-130s. The country can afford their current equipment and maintain it, but they are hampered by literacy and governance. FID operations would need to focus on improving existing operational and maintenance capabilities while developing tools to deal with corruption. The country could reach into the Developing Group with aide and reform.

NORWAY

A U.S. partner in JF-35 Lightning II development, Norway is a relatively small country with only 5.2 million population. Their long standing ties to the U.S. and NATO marks them as one of the premiere partners in world.

Category	Norway	Score
Literacy	99.8%	10
Economic	GDP (PPP) – 365B Unemployment – 4.8%	7
Governance	Stability – A Security – A Legal – A Govt – A Corruption Index – 85 (2.5+2.5+2.5+2.5)-(0)	10
Immigration	Immigration +6.6%	10
Logistics	LPI – 3.73	8
Aviation	Level (G4+) Recency (0) Civil Industry (Developed)	10
TOTAL	DEVELOPED	55

Figure 16

ANALYSIS: Score: 54. Norway meets the requirements for Developed. The relatively small size of the nation, its small professional Air Force, and lower GDP (PPP) is easy to misread as indicative of lower technological capacity. However, its strength of governance and progressive aviation market make it capable of handling even the most advanced airframes. The Royal Norwegian Air Force currently flies advanced helicopters, F-16s, Augusta-Westlake 101s, P-8s, French Dassault Falcon 200, and the P-3 Orion. FID efforts might focus on customs and timeliness of logistics, areas where they were downgraded on the LPI.

AFGHANISTAN (2017)

As the last case study, modern Afghanistan can be used in the model to see where they currently stand and what challenges the U.S. might face as IDAD operations continue.

Category	Afghanistan	Score
Literacy	38.2%	0
Economic	GDP (PPP) – 64B Unemployment – 40%	2
Governance	Stability – E Security – E Legal – E Govt – E Corruption Index – 15 (0+0+0+0)-(10)	-10
Immigration	Emigration -1.2%	2.5
Logistics	LPI – 2.14	0
Aviation	Level (75-90) Recency (0) Civil Industry (Early)	4
TOTAL	UNDEVELOPED	-1.5

Figure 17

ANALYSIS: Score: -1.5. Afghanistan is below the line for an Undeveloped Nation. The Afghans are operating and nominally maintaining some aviation assets. The areas destroying the aviation enterprise in Afghanistan are the massive levels of illiteracy, surging unemployment and lack of governance. Afghanistan registers in the worst ten in the world on the LPI and CPI. Combined with an exodus of skilled people is creating the worst possible conditions. Another problem is that Mi-17s, C-130s, MD-530s, A-29s and HH-60s are outside the technical level of aircraft appropriate for an undeveloped nation. Operating outside of the recommended zone extends the time required to make a country self-sufficient. IDAD efforts will not likely be successful until Afghanistan scores in high single or double digits. This puts end of mission beyond 2030.

CONCLUSION

Forget about political agendas. Dismiss the ghosts of previous wars. Instead, think about the U.S. National Security Strategy. Stability and security are at the center of this long-range plan. The U.S. has the capacity to conduct aviation FID and IDAD if the nation's will is resolute and it can modify its behavior to embrace realities. However, the U.S. cannot be everywhere and should not do everything. Nations must learn to protect themselves, administer good governance, and provide the conditions for their people to prosper. If the ultimate goal is to

teach other nations to be better, then it must start with an honest and fair assessment of the current conditions.

The U.S. will continue to face this challenge in Afghanistan and future conflicts. In order to meet U.S. National Strategic goals and achieve aviation-related security interests abroad, U.S. senior leaders should consider the following modifications to policy:

Recommendation #1: Rewrite Joint Publication 3-22. FID and IDAD belong in the same publication. However, they are vastly different in scope and scale. Confusing language that relates the two should be stricken and replaced with clear, articulate prose that makes IDAD requirements, investment, and time scales clear to all actors - political and military. Whole of government avenues must be enacted that address the trappings of advanced aviation in a hollow or corrupt political systems.

Recommendation #2: Air Force Manning Documents and command structures should be amended to correct the FID/IDAD application disparity. Upon study, recommendations should be made for manning that either generates equal advising capabilities between operations, maintenance, and logistics, or favors the latter two. Universally, maintenance and logistics are the greatest obstacle to a capable and sustainable force. Phase 5 redeployment does not happen until they succeed. The uniformed maintenance force and logistics advisors should easily outnumber the operators by a factor of two, if not more.

Recommendation #3: Air Force and State Department leaders should adopt RACAM as their model for initial assessment for aviation assistance. The U.S. cannot treat every nation the same. They are not. RACAM is a tool that helps determine the strengths, weaknesses, and capacity of every nation in the world through independent, international algorithms. If this model proves ineffective or untenable, then a similar such product should be developed for the

same intended application. Robust study into appropriate pre-approved "bins" of aircraft for nations of different technological capacity will help eliminate years of frustration and abandoned projects.

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